



Original Article

## Prevalence of Work-Related Musculoskeletal Problems and Perceived Job Risk Factors among Nurses at Tertiary Level Hospitals in Sylhet

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### ABSTRACT

*Work-Related Musculoskeletal Problems (WRMSPs) present a significant health concern, particularly among nurses in tertiary-level hospitals. This cross-sectional study, conducted from January 1 to December 31, 2019, investigated the prevalence of WRMSPs and the perceived job risk factors of WRMSPs among 307 nurses from Jalalabad Ragib-Rabeya Medical College Hospital and Sylhet Women's Medical College Hospital in Sylhet district, Bangladesh. By employing a previously validated semi-structured four-sectioned questionnaire, data on socio-demographics, work-related factors, perceived job risks, and the Nordic Musculoskeletal Questionnaire (NMQ) for musculoskeletal pain were collected and analysed using SPSS version 25. The results revealed that 66.1% of the participants had WRMSPs in the past 12 months. A significant correlation between MSP and age was identified ( $p$ -value=0.002). The findings reveal a higher prevalence of musculoskeletal disorders among females. Treating an excessive number of patients in one day (99%), bending or twisting the back in an awkward posture (90.2%), and working very fast for short periods (lifting, grasping, pulling, etc.) (91.9%) were the most perceived job risk factors. Statistically significant associations were found between WRMSPs and various occupational factors, including managing patients with disabilities ( $p$ =0.012), treating an excessive number of patients ( $p$ =0.038), awkward back movements ( $p$ =0.018), and lifting heavy materials ( $p$ =0.009). Given the high prevalence of work-related musculoskeletal disorders among nurses in this study and the strong association with specific risk factors, these findings emphasise the need for structured ergonomic programs and improved work conditions to mitigate WRMSPs and enhance nurses' productivity and job satisfaction.*

**Keywords:** Work-related musculoskeletal problems, Nurses, Job risk factors, Nordic Musculoskeletal Questionnaire.

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### INTRODUCTION

Musculoskeletal problems (MSPs) are a common painful degenerative and inflammatory condition worldwide<sup>1,2</sup>. MSPs are caused by exposure to risk factors<sup>3</sup> such as force, repetition, posture, poor work practices, poor fitness, and

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poor health habits. Occupational factors include inadequate ergonomic design of workstations and tools, work environment, inappropriate work systems, and workplace accidents leading to injury. When an employee encounters risk factors associated with musculoskeletal disorders (MSDs), they subsequently experience fatigue. Once the state of fatigue exceeds the body's inherent recovery mechanisms, an imbalance within the musculoskeletal system arises. Over an extended duration, as fatigue

continues to surpass recovery capabilities and the musculoskeletal imbalance remains unaddressed, a disorder of the musculoskeletal system emerges<sup>3</sup>. Within any professional environment, musculoskeletal issues, which are increasingly acknowledged as a critical health matter, exert a remarkable influence by imposing constraints on physical function and heightened levels of absenteeism<sup>2</sup>.

Nurses represent a significant group of professionals who face a heightened susceptibility to experiencing musculoskeletal issues linked to their work. This issue is particularly prominent in developing and less-developed nations, possibly attributed to extended hospital admissions, heightened patient caseloads<sup>4,5</sup>, increased workload demands, prolonged shifts, scarce resources, maintenance of uncomfortable postures, sustained static positions, and the adoption of awkward bending or twisting movements of the back<sup>1,6,7</sup>. MSPs represent a significant factor leading to absenteeism, limitations in work activities, or even necessitating a change in employment<sup>6,8</sup>, resulting in disability more than any other group of diseases that impacts work performance, overall well-being, and quality of life<sup>1,2,7,9</sup>. According to the Occupational Safety and Health Administration (OSHA) and the Bureau of Labor Statistics, nurses belong to the top 10 occupations at high risk for developing work-related musculoskeletal problems, with a prevalence ranging from 40 to 90% among the global nursing workforce<sup>5,10</sup>. Furthermore, female employees demonstrate a greater vulnerability to WRMSPs when compared to their male counterparts<sup>5,11</sup>. In a hospital setting, nurses constitute the primary workforce who operate near patients, medical instruments, and the hospital surroundings<sup>8</sup>. They are required to attend to patients with various conditions such as disorientation, disability, emergencies, etc.<sup>9</sup>. Engaging in shift work can present challenges as it complicates the restoration of work-life balance and non-work-related activities. Shift rotations involving night shifts can disrupt the body's circadian rhythm, introduce varying levels of workload, and hinder effective communication and participation in preventive measures compared to other work schedules<sup>1</sup>. It was approximated that 3.5% of nurses are departing from their occupation as a result of experiencing back discomfort<sup>6,7,12</sup>.

Despite nurses being acknowledged to have a high susceptibility to developing musculoskeletal issues related to their work<sup>13</sup>, it remains one of the least researched professions in Bangladesh<sup>14</sup>. The incidence of WRMSPs among nursing personnel and associated risk factors holds significance for healthcare policymakers and practitioners aiming to mitigate the prevalence of such issues. To enhance patient care, ensure a conducive patient setting,

and optimize productivity, nurses must operate within a conducive work environment that adheres to proper ergonomic principles. This study aimed to evaluate the prevalence of WRMSPs and perceived occupational risk factors among nurses. It further sought to analyse the key risk factors contributing to WRMSPs by examining their occurrence and associated determinants within the nursing profession.

## MATERIALS AND METHODS

This cross-sectional study was carried out among nurses at Jalalabad Ragib-Rabeya Medical College Hospital, Sylhet, and Women's Medical College Hospital, Sylhet, from January 1 to December 31, 2019, with a sample size of 307. The research sites were purposefully chosen based on sample availability. Both male and female nurses were considered in the inclusion criteria, who had been employed at the hospital for a minimum of one year and the participants exhibited their preparedness to engage in the research. Exclusion criteria involved nurses with musculoskeletal injuries, recent accidents, and current pregnancy status. Convenient sampling was used to select participants available first and fulfilled the inclusion and exclusion criteria. Data was gathered through a pre-tested questionnaire with 4 parts: (i) Socio-demographic section includes factors like age, sex, marital status, education, and income. (ii) Work-related section consists of details like working unit, dealing with patients, and work experience (iii) The job risk factors section focuses on workers' perceptions of physically stressful factors at work. It includes a list of thirteen conditions that could cause pain or injury, answered with yes or no. (iv) Standardized Nordic Musculoskeletal Questionnaire gathers data on musculoskeletal pain over the past year, as outlined by Kuorinka et al<sup>15</sup>. A checklist was designed to collect the height and weight of the participants. Data was acquired through direct face-to-face interviews with individuals who met the specified selection criteria. The aims and objectives of the research were initially elucidated to the participants. If consent was granted, a written form was issued. Participants received assurances regarding the confidentiality of their disclosed information. Approval from the Institutional Review Board of the National Institute of Preventive and Social Medicine (NIPSOM), Mohakhali, Dhaka-1212 was secured. Participation in this research was entirely voluntary. The research did not entail utilizing any records, such as hospital or medical records. Collected data was checked, rechecked, edited, coded and recorded for quality management. The analysis of the data was conducted using SPSS version 25 software. Qualitative data were presented as frequency, percentage, and quantitative data as mean, and standard deviation. The

chi-square test was utilized to examine the relationship between musculoskeletal problems and associated factors, with Fisher's exact test used when Chi-square was not suitable. A statistically significant level of  $p < 0.05$  was set for all statistical tests in the study.

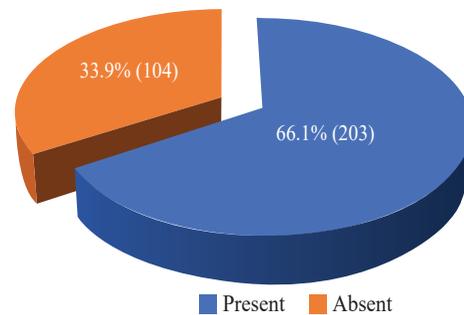
**RESULTS**

The study was conducted among 307 participants. The socio-demographic and work-related details revealed that the mean age of the participants was  $27.53 \pm 5.83$  years, with the age ranging from 23 years to 65 years. The composition of this study included 74.6% (229) females and 25.4% (78) males; 72.3% (222) of participants were diploma nurses, while 27.7% (85) held a B. Sc in Nursing. Their mean monthly income was  $20,012.92 \pm 4,126.1$  taka, and their mean BMI was  $22.3 \pm 3.2$  kg/m<sup>2</sup>. Their mean workday

was  $7.22 \pm 2$  hours and had a mean of  $4.3 \pm 4.84$  years of work experience (table-I). Among the study participants, the prevalence of work-related musculoskeletal problems (MSPs) was 66.1% (203) in the past 12 months (figure-I). From the relationship between socio-demographic characteristics and musculoskeletal problems (MSPs) over the past 12 months, a significant association was observed with age, as 65.1% of participants under 40 years reported MSPs, compared to only 1% among those aged 40 years or older ( $p = 0.002$ ). No significant differences in MSP prevalence were noted based on sex ( $p = 0.873$ ), educational qualification ( $p = 0.451$ ), monthly income ( $p = 0.427$ ), or body mass index (BMI) ( $p = 0.106$ ). These findings suggest that age may be key in MSP prevalence, while other sociodemographic factors showed no statistically significant association (table-II). The respondents managed various patient conditions, including 99% handling emergency patients. Most participants

**Table-I:** Description of nurses involved in the study, (n=307).

Sociodemographic information	Mean±SD
Age	27.53±5.83
Monthly income (taka)	20012.92±4126.1
BMI (kg/m <sup>2</sup> )	22.3±3.2
Working hours per day	7.22±2
Work experience (years)	4.3±4.84



**Figure-1:** Prevalence of musculoskeletal problems (MSPs) over the past 12 months, (n=307).

**Table-II:** Distribution of sociodemographic variables among participants with musculoskeletal problems over the last 12 months, (n=307).

Socio-demographic characteristics	Any MSP in the last 12 months		p-value
	Present	Absent	
Age	<40	200 (65.1)	0.002
	≥40	3 (1)	
Sex	Male	51 ( 16.6 )	0.873
	Female	152 ( 49.5 )	
Educational qualification	B. Sc	59 ( 19.2 )	0.451
	Diploma	144 ( 46.9 )	
Monthly income (taka)	≤ 20000/-	158 ( 51.5 )	0.427
	20001/- to 25000/-	26 ( 8.5 )	
	≥ 25001/-	19 (6.2)	
Body mass index	<18.5	27 ( 8.8 )	0.106
	18.5 to 24.9	142 ( 46.3 )	
	25 to 29.9	33 ( 10.7 )	
	>29.9	1 (0.3)	

\*Percentages in parentheses

**Table-III:** Association between work-related risk factors and MSPs in the last 12 months.

Work-related factors	MSPs		Chi-square	Fisher's exact test
	Yes	No		
<b>The working unit of the respondent</b>				
Medicine and allied (n=70)	40 (13.0)	30 (9.8)	p=0.070	
Surgery and allied (n=47)	34 (11.1)	13 (4.2)		
Orthopaedics (n=41)	29 (9.4)	12 (3.9)		
Obstetrics & Gynaecology (n=48)	33 (10.7)	15 (4.9)		
Paediatrics (n=38)	31 (10.1)	7 (2.3)		
ICU and critical care unit (n=63)	36 (11.7)	27 (8.8)		
<b>Patient's conditions managed by respondents</b>				
Patients with disabilities (n=273; 88.9%)	174 (56.7)	99 (32.2)	<b>p=0.012</b>	p=0.266
Patients with emergency (n=304; 99%)	202 (65.8)	102 (33.2)		
Disoriented patients (n=283; 92.2%)	186 (60.6)	97 (31.6)	p=0.612	
<b>Job risk factors</b>				
Performing the same task over and over (n=269)	179 (58.3)	90 (29.3)	p=0.680	<b>p=0.038</b>
Working very fast for short periods (lifting, grasping, pulling, etc.) (n=282)	188 (61.2)	94 (30.6)	p=0.500	
Having to handle or grasp small objects (n=276)	184 (59.9)	92 (30)	p=0.549	
Treating an excessive number of patients in one day (n=304)	203 (66.1)	101 (32.9)		
Working in an awkward or cramped position (n=57)	163 (53.1)	87 (28.3)	p=0.474	
Working in the same positions for a long period (n=276)	184 (59.9)	92 (30.0)	p = .549	
Bending or twisting the back in an awkward way (n=277)	189 (61.6)	88 (28.7)	<b>p=0.018</b>	
Working near or at the physical limit (n=262)	172 (56.0)	90 (29.3)	p=0.671	
Reaching or working over the head or away from the body (n=207)	141 (45.9)	66 (21.5)	p=0.289	
Continuing work when injured or hurt (n=177)	123 (40.1)	54 (17.6)	p=0.146	
Carrying, lifting or moving heavy materials or equipment (n=175)	105 (34.2)	70 (22.8)	<b>p=0.009</b>	
Work scheduling (overtime, irregular shifts, length of workday) / Job rotation (n=104)	69 (22.5)	35 (11.4)	p=0.953	
Insufficient breaks or pauses during the work (n=39)	31 (10.1)	8 (2.6)	p=0.059	

\*Percentages in parentheses

worked in medicine and allied (22.8%) and ICU/critical care (20.5%). Among 307 participants, 99% (304) identified treating an excessive number of patients in one day and only 12.7% (39) insufficient breaks or pauses during work as a job risk factor.

From the link between work-related factors and musculoskeletal problems (MSPs) in respondents over the past 12 months, statistically significant associations (p<0.05) were found with managing patients with disabilities (p=0.012), treating an excessive number of patients in a day (p=0.038), bending or twisting the back awkwardly (p=0.018), and carrying or lifting heavy materials or equipment (p=0.009). These findings highlight

key occupational risk factors contributing to MSPs among nurses (table-III).

**DISCUSSION**

Musculoskeletal disorders exhibit considerable variability across different occupational categories and international borders<sup>13</sup>. The nursing profession is characterized as having a significant risk for the onset of musculoskeletal pain (MSP). The research was conducted to assess the prevalence and job risk factors of work-related musculoskeletal problems among the nurses of the Jalalabad Ragib-Rabeya Medical College Hospital and Sylhet Women's Medical College Hospital, two

tertiary-level medical facilities located in the Sylhet district.

The research findings indicated that 66.1% (203) of the participants had WRMSPs over the past 12 months. Another study conducted among nurses in south-west Ethiopia also revealed a 12-month frequency of 60.8% (183)<sup>9</sup>. Both the results showed a much lower prevalence than that reported by other studies<sup>1,2,6,7,14</sup>. These differences in the prevalence might be because participants in this study had a mean work experience for only 4.3±4.84 years whereas the above-mentioned studies had participants with mean work experience of more than 7 years. On the other hand, Yasobant and Rajkumar found a relatively lower 12-month prevalence than this current study, which was 55.5%<sup>13</sup>. Soylar and Ozer in their review study found the prevalence of musculoskeletal disorders to range between 33% and 88% for nurses throughout the world<sup>8</sup>.

In the present investigation, a strong statistically significant association was observed between MSP and age, with a p-value of 0.002. A higher prevalence of MSPs was observed among participants under 40 years (65.1%) which is similar to other studies<sup>2,7,13</sup>. These findings suggest that younger nurses may be more susceptible to MSPs, potentially due to increased physical workload, prolonged standing, and engagement in more physically demanding tasks<sup>7</sup>. The gender distribution of WRMSPs in this study affirms the results of numerous other studies, which similarly indicate a female predominance in musculoskeletal disorder prevalence<sup>2,13</sup>.

The participants of this study identified treating an excessive number of patients (99%), working very fast for short periods (lifting, grasping, pulling, etc.) (91.9%), and bending or twisting the back awkwardly (90.2%) being the most prevalent job-related risk factors for WRMSPs. Additionally, handling small objects (89.9%) and performing repetitive tasks (87.6%) were significant factors. On the contrary, other studies highlighted working in the same positions for long periods (55.1%)<sup>2,7</sup>, lifting or transferring dependent patients (52.4%)<sup>6</sup>, and working in awkward and cramped positions (29.20%)<sup>13</sup> as perceived job risk factors.

Insufficient breaks during work (12.7%) were deemed the least significant job risk factor in this study. In contrast, research by Tinubu et al. indicated that 39% of participants experienced inadequate rest breaks during the workday<sup>2</sup>, while 31.4% attributed this to Anap, Iyar, and Rao<sup>6</sup>.

In the preceding 12 months, amidst the patient's conditions managed by the participants, addressing patients with disabilities displayed a notable association with MSPs (p=0.012).

Statistically significant associations were also observed with treating an excessive number of patients per day (p=0.038), bending or twisting the back in an awkward manner (p=0.018), and carrying, lifting or moving heavy materials or equipment (p=0.009). This highlights a significant burden of WRMSPs among the respondents.

### LIMITATIONS

While this study aimed to determine the prevalence of work-related musculoskeletal disorders (WRMSDs) among nurses, along with their associated risk factors and socio-demographic characteristics, certain limitations should be acknowledged. The study's sample and setting were purposefully selected, restricting the generalizability of the findings beyond the specific population. Additionally, the accuracy of data on musculoskeletal issues from the past year relied on participants' memory, posing a risk of recall bias. As with other self-reported or cross-sectional studies, there is also the possibility of participants providing inaccurate or exaggerated responses, leading to subjective interpretations of WRMSDs.

### CONCLUSION

In conclusion, the study revealed that a significant number of nurses in selected tertiary care hospitals in Sylhet experienced work-related musculoskeletal problems (WRMSPs) in the past year, with various socio-demographic and occupational risk factors influencing their occurrence. Factors such as handling patients with disabilities, treating an excessive number of patients in one day, bending or twisting the back in awkward ways, and carrying, lifting, or moving heavy materials or equipment were significantly associated with the development of WRMSPs. These findings underscore the need for targeted interventions to address manual patient care activities, particularly focusing on improving working conditions and implementing preventive measures to reduce musculoskeletal complaints. Further research on a larger scale is essential to better understand the long-term impact and to refine strategies for risk reduction in healthcare settings.

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